UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/853,323	05/10/2001	Takeshi Hoshida	064731.0183	5870

7590 02/07/2006

Terry J. Stalford, Esq.
Baker Botts L.L.P.
Suite 600
2001 Ross Avenue
Dallas, TX 75201-2980

EXAMINER	
BELLO, AGUSTIN	
ART UNIT	**PAPER NUMBER**
2633	

DATE MAILED: 02/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/853,323	HOSHIDA ET AL.	
	Examiner	Art Unit	
	Agustin Bello	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 November 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/13/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Appeal Brief

1. Applicant's appeal of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-6, 8-9, 11-18, 20-21, 23-24, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitajima (U.S. Patent No. 5,515,196) in view of Du (U.S. Patent No. 6,417,958).

Regarding claim 1, 13, 23, and 26, Kitajima teaches modulating a non-intensity characteristic of an optical carrier signal with a data signal (reference numeral 13-10a in Figure 32) to generate an optical information signal; transmitting the optical information signal over an optical link (e.g. output of phase modulator 13-10b in Figure 32), and amplifying the optical information signal over a length of the optical link (reference numeral 102 in Figure 11). Kitajima differs from the claimed invention in that Kitajima fails to specifically teach that the optical information signal is amplified with a co-launched amplification signal traveling in a same direction as the optical information signal in the optical link. However, Du, in the same field of optical communication, teaches that it is well known in the art to amplify an optical information signal over a length of an optical link with a co-launched amplification signal

traveling in a same direction as the optical information signal in the optical link (see abstract). One skilled in the art would have been motivated to amplify an optical information signal over a length of an optical link with a co-launched amplification signal traveling in a same direction as the optical information signal in the optical link in order to provide for a reduction of signal-pump-signal cross talk (column 3 lines 31-37). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to amplify an optical information signal over a length of an optical link with a co-launched amplification signal traveling in a same direction as the optical information signal in the optical link as taught by Du in the system of Kitajima.

Regarding claim 2 and 14, the combination of Kitajima and Du teaches that the co-launched amplification signal travels at a substantially same speed as the optical information signal (e.g. both signals being light signals, they each travel at the speed of light).

Regarding claim 3 and 15, the combination of Kitajima and Du teaches that the co-launched amplification signal comprises a wavelength lower than that of the optical information signal (column 7 lines 32-34 of Du).

Regarding claim 4 and 16, the combination of Kitajima and Du teaches that the optical information signal is amplified over the length of the optical link with the co-launched amplification signal by distributed Raman amplification (DRA) (as noted in the abstract and seen in Figure 4 of Du).

Regarding claim 5 and 17, the combination of Kitajima and Du teaches generating a plurality of optical information signals (reference numeral 110 in Figure 11 of Kitajima) each comprising a wavelength distinct carrier signal having the non-intensity characteristic modulated with a data signal (reference numeral 13-10a in Figure 32 of Kitajima), multiplexing the plurality

of optical information signals to generate a wavelength division multiplexed (WDM) signal (reference numeral 112 in Figure 11 of Kitajima) , transmitting the WDM signal over the optical link (reference numeral 101 in Figure 11 of Kitajima); and amplifying the WDM signal over the length of the optical link (reference numeral 102 in Figure 11 of Kitajima) with a plurality of co-launched amplification signals transmitted in the same direction as the WDM signal (see abstract of Du).

Regarding claim 6, 18, and 24, the combination of Kitajima and Du teaches that the phase of the optical carrier is modulated with the data signal (reference numeral 13-10a in Figure 32 of Kitajima).

Regarding claim 8 and 20, the combination of Kitajima and Du teaches further amplifying the optical information signal over a second length of the optical link with a counter-launched amplification signal traveling in an opposite direction as the optical information signal and the co-launched amplification signal (Figure 13 if Du).

Regarding claim 9 and 21, the combination of Kitajima and Du teaches that the optical information signal and the co-launched amplification signal travel in the first direction, further comprising: modulating the non-intensity characteristic of a second optical carrier signal with a second data signal to generate a second optical information signal (reference numeral 13-10a in Figure 32 of Kitajima; reference numeral 320 in Figure 12 of Du); transmitting the second optical information signal over the optical link in a second direction opposite the first direction (Figure 12 of Du); and amplifying the first and second optical information signals over the length of the optical link with the co-launched amplification signal and a counter-launched

amplification signal traveling in the second direction (reference numeral 240, 400 in Figure 12 of Du).

Regarding claim 11, the combination of Kitajima and Du teaches further amplifying the signal in the optical link with a discrete amplifier (reference numeral 102 in Figure 11 of Kitajima; reference numeral 220 in Figure 12 of Du).

Regarding claim 12, the combination of Kitajima and Du teaches that the discrete amplifying comprises an erbium-doped fiber amplifier (reference numeral 220 in Figure 12 of Du).

4. Claims 7, 10, 19, 22, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitajima in view of Du, and further in view of Ohya (U.S. Patent No. 6,556,327).

Regarding claim 7, 19, and 25, the combination of Kitajima and Du differs from the claimed invention in that it fails to specifically teach that the frequency of the optical carrier signal is modulated with the data signal. However, Ohya, in the same field of optical transmitters, teaches that this concept is well known in the art (Figure 7). One skilled in the art would have been motivated to modulate the frequency of the optical carrier signal with a data signal in order to allow a simpler configuration and to reduce the power consumption in comparison to the phase modulation setup of Kitajima (column 10 lines 19-25 of Ohya). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modulate the frequency of the optical carrier signal with a data signal as taught by Ohya in the system of the combination of Kitajima and Du.

Regarding claim 10 and 22, the combination of Kitajima, Du, and Ohya teaches remodulating the optical information signal with a transmission clock frequency using an

intensity modulator (reference numeral 30 in Figure 7 in Ohya) to generate a multimodulated signal, transmitting the multimodulated signal over the optical link (reference numeral 101 in Figure 11 of Kitajima); and amplifying the multimodulated signal over the length of the optical link (reference numeral 102 in Figure 11 of Kitajima) with the co-launched amplification signal traveling in the same direction as the multimodulated signal (abstract of Du).

5. Claims 1-5, 7-9, 11-17, 19-21, 23, and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergano (U.S. Patent No. 6,310,709) in view of Du (U.S. Patent No. 6,417,958).

Regarding claim 1, 13, 23, and 26, Bergano teaches modulating a non-intensity characteristic of an optical carrier signal with a data signal (reference numeral 102 in Figure 1) to generate an optical information signal; transmitting the optical information signal over an optical link (e.g. output of phase modulator 108 in Figure 1). Bergano differs from the claimed invention in that Bergano fails to specifically teach amplifying the optical information signal over a length of the optical link with a co-launched amplification signal traveling in a same direction as the optical information signal in the optical link. However, Du, in the same field of optical communication, teaches that it is well known in the art to amplify an optical information signal over a length of an optical link with a co-launched amplification signal traveling in a same direction as the optical information signal in the optical link (see abstract). One skilled in the art would have been motivated to amplify an optical information signal over a length of an optical link with a co-launched amplification signal traveling in a same direction as the optical information signal in the optical link in order to provide for a reduction of signal-pump-signal cross talk (column 3 lines 31-37). Therefore, it would have been obvious to one skilled in the art

at the time the invention was made to amplify an optical information signal over a length of an optical link with a co-launched amplification signal traveling in a same direction as the optical information signal in the optical link as taught by Du in the system of Bergano.

Regarding claim 2 and 14, the combination of Bergano and Du teaches that the co-launched amplification signal travels at a substantially same speed as the optical information signal (e.g. both signals being light signals, they each travel at the speed of light).

Regarding claim 3 and 15, the combination of Bergano and Du teaches that the co-launched amplification signal comprises a wavelength lower than that of the optical information signal (column 7 lines 32-34 of Du).

Regarding claim 4 and 16, the combination of Bergano and Du teaches that the optical information signal is amplified over the length of the optical link with the co-launched amplification signal by distributed Raman amplification (DRA) (as noted in the abstract and seen in Figure 4 of Du).

Regarding claim 5 and 17, the combination of Bergano and Du teaches generating a plurality of optical information signals (reference numeral 120 in Figure 12 of Du) each comprising a wavelength distinct carrier signal having the non-intensity characteristic modulated with a data signal (reference numeral 102 in Figure 1 of Bergano), multiplexing the plurality of optical information signals to generate a wavelength division multiplexed (WDM) signal (reference numeral 140 in Figure 12 of Du) , transmitting the WDM signal over the optical link (reference numeral 160 in Figure 1 of Du); and amplifying the WDM signal over the length of the optical link (reference numeral 220 in Figure 12 of Du) with a plurality of co-launched amplification signals transmitted in the same direction as the WDM signal (see abstract of Du).

Regarding claim 7, 19, and 25, the combination of Bergano and Du teaches that the frequency of the optical carrier signal is modulated with the data signal (reference numeral 102, 104, 106 in Figure 1 of Bergano).

Regarding claim 8 and 20, the combination of Bergano and Du teaches further amplifying the optical information signal over a second length of the optical link with a counter-launched amplification signal traveling in an opposite direction as the optical information signal and the co-launched amplification signal (Figure 13 if Du).

Regarding claim 9 and 21, the combination of Bergano and Du teaches that the optical information signal and the co-launched amplification signal travel in the first direction, further comprising: modulating the non-intensity characteristic of a second optical carrier signal with a second data signal to generate a second optical information signal (reference numeral 102 in Figure 1 of Bergano; reference numeral 320 in Figure 12 of Du); transmitting the second optical information signal over the optical link in a second direction opposite the first direction (Figure 12 of Du); and amplifying the first and second optical information signals over the length of the optical link with the co-launched amplification signal and a counter-launched amplification signal traveling in the second direction (reference numeral 240, 400 in Figure 12 of Du).

Regarding claim 11, the combination of Bergano and Du teaches further amplifying the signal in the optical link with a discrete amplifier (reference numeral 102 in Figure 11 of Bergano; reference numeral 220 in Figure 12 of Du).

Regarding claim 12, the combination of Bergano and Du teaches that the discrete amplifying comprises an erbium-doped fiber amplifier (reference numeral 220 in Figure 12 of Du).

6. Claims 6, 10, 18, 22, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergano in view of Du, and further in view of Ohya (U.S. Patent No. 6,556,327).

Regarding claim 6, 18, and 24, the combination of Bergano and Du differs from the claimed invention in that it fails to specifically teach that the phase of the optical carrier signal is modulated with the data signal. However, Ohya, in the same field of optical transmitters, teaches that this concept is well known in the art (Figure 7). One skilled in the art would have been motivated to modulate the phase of the optical carrier signal with a data signal in order to allow excellent carrier to noise ratio (column 3 lines 6-14 of Ohya). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modulate the phase of the optical carrier signal with a data signal as taught by Ohya in the system of the combination of Bergano and Du.

Regarding claim 10 and 22, the combination of Bergano and Du teaches transmitting the multimodulated signal over the optical link (reference numeral 101 in Figure 11 of Bergano); and amplifying the multimodulated signal over the length of the optical link (reference numeral 102 in Figure 11 of Bergano) with the co-launched amplification signal traveling in the same direction as the multimodulated signal (abstract of Du), but differs from the claimed invention in that it fails to specifically teach remodulating the optical information signal with a transmission clock frequency using an intensity modulator to generate a multimodulated signal. However, Ohya teaches remodulating the optical information signal with a transmission clock frequency using an intensity modulator (reference numeral 30 in Figure 7 in Ohya) to generate a multimodulated signal. One skilled in the art would have been motivated to do so in order to stabilize the intensity of the transmitted light signal. Therefore, it would have been obvious to

one skilled in the art at the time the invention was made to remodulate the optical information signal with a transmission clock frequency using an intensity modulator to generate a multimodulated signal.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (571) 272-3026. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AB

A. Bello
AGUSTIN BELLO
PRIMARY EXAMINER